

Appl No. 10/552,096

Amendment Dated March 13, 2008

Reply to Office action Date: December 18, 2007

Amendments to the Drawings:

Please insert Figure 3 with the following Replacement Sheet attached hereto.
No new matter is believed entered.

Attachment: Replacement Sheet for Figure 3

Remarks/Arguments

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 1-2 and 6-7 have been amended.

Figure 3 has been added, and the specification has been amended as noted to provide proper reference to Figure 3. No new matter has been entered.

The drawings were objected to for failure to show every feature of the invention specified in the claims. Specifically, the Examiner stated that the "suction pipe being arranged in heat exchange relationship with the container" from claim 6 was not shown in the drawings. Accordingly, Figure 3 has been added to schematically show the suction pipe (11a) being arranged in heat exchange relationship (50) with the container (19, 19a) such that heat can be transferred from the refrigerant in the container (19, 19a) to the refrigerant in the suction pipe (11a). The specification has similarly been amended to provide proper reference to Figure 3. It is to be appreciated that Figure 3 illustrates the heat exchange relationship in a schematic fashion. Support can be found in the specification as originally filed on page 3, lines 14-20. Thus, no new matter has been entered. Accordingly, it is respectfully requested that the objection be withdrawn.

Claims 1, 6, and 7 were rejected variously under 35 USC 112. Regarding claim 6, the Examiner stated that the heat exchange relationship was omitted. Thus, amended claim 6 now states, in pertinent part, "the suction pipe (11a) being arranged in heat exchange relationship (50) with the container (19, 19a) such that heat is transferred from the refrigerant in the container (19, 19a) to the refrigerant in the suction pipe (11a)." Support can be found in the specification as originally filed on page 3, lines 14-20. Thus, no new matter has been entered. Accordingly, it is respectfully requested that the rejection be withdrawn.

Regarding claim 1, the phrase "or the like" has been removed therefrom. Similar changes have been made to claim 2. Accordingly, it is respectfully requested that the rejection be withdrawn.

Regarding claim 7, the Examiner stated that the method steps were omitted. Thus, claim 7 have been amended to more clearly and particularly describe the claimed method steps. Support can be found in the specification as originally filed on page 2, lines 13-31. Thus, no new matter has been entered. Accordingly, it is respectfully requested that the rejection be withdrawn.

Claims 1-4 and 7 were rejected under 35 U.S.C. 102 by Alsenz (U.S. 4,679,404). Respectfully, the rejection is traversed for the following reasons. The present invention discloses a refrigeration system comprising two evaporators and a container provided with a first outlet communicating with a first evaporator via a first valve and a second outlet communicating with a second evaporator to circulate the remaining part of the refrigerant through the second evaporator when the volume has been stored in the container. For this purpose, the second outlet is positioned above the first outlet. Such a refrigerator system is advantageous since a volume of warm condensate can be hidden in the container. The system of the present invention has a high system coefficient of performance, thereby reducing energy consumption.

In distinction, Alsenz discloses a control system for controlling a closed loop refrigeration system having multiple parallel commonly piped compressors (see the abstract). Referring to Figure 1 of Alsenz, the pressurized refrigerant vapor is condensed to a liquid in a condenser coil 18 and delivered to a receiving vessel 20. From the receiving vessel 20, the liquid refrigerant flows from a single common line 22 through line 24 to an expansion device or valve 26 for operation in conjunction with a first evaporator coil 27. The liquid refrigerant also flows from the single common line 22 through line 23 to an expansion device or valve 25 for operation in conjunction with a second evaporator coil 29. The liquid refrigerant is injected through the respective expansion valves 26 and 25 into their respective evaporator coils 27 and 29, thus absorbing heat from the coils and cooling the surrounding respective areas 30 and 31 (see col. 10 lines 31-46).

As a result, the receiving vessel 20 of the system disclosed by Alsenz has only a single outlet 22 which divides into two lines 23 and 24 at the same side of the receiving vessel 20. The configuration shown in Figure 1 of Alsenz cannot temporarily hide a volume of warm condensate. Using the system of Alsenz, a volume of condensate may be collected in the receiving vessel 20 only if the two valves 25 and 26 are closed. Note that this configuration is not really relevant since the refrigerant is then completely blocked at the receiving vessel 20 of the system. Further, in this configuration, the volume collected in the receiving vessel would not be hidden as it is located before both valves 25 and 26. If only one of the valves, e.g. valve 25, is closed, the refrigerant will not be collected in the receiving vessel 20 but will flow in line 24 to the evaporator 27 via valve 26. Thus, Alsenz cannot provide the advantages of the refrigeration system of the present invention.

The present invention differs from Alsenz in that the second outlet of the container communicates with the second evaporator to circulate the remaining part of the refrigerant through the second evaporator when the volume has been stored in the container and that the second outlet is positioned above the first outlet. With the system of the present invention, when the valve 22 is closed, the warm condensate is collected in the container 19, i.e. hidden for the system until it fills the container and then circulates to the second evaporator 28 via valve 29.

To further illustrate the difference between the system of the present invention and the system disclosed by Alsenz, it is noted that in Alsenz the refrigerant must always pass through the receiving vessel 20 (as shown in Figure 1). To the contrary, in the present invention, if the valve 22 is closed, the warm condensate is collected and temporarily hidden and trapped in the container 19 until the container is filled. Then, the remaining amount of refrigerant circulating in the system will directly circulate via line 27 to the evaporator 28, provided that the valve 29 is opened. This configuration is not possible with the system of Alsenz.

Thus, the refrigeration system of the present invention clearly differs from the system of Alsenz. The system of Alsenz does not provide the same advantages as the system of the present invention.

As substantiated on page 2 line 33 to page 3 line 6 of the application, the invention relies on the level relation in positioning between the first outlet of the container connecting it with the first valve and the second outlet of the container connecting it with the second valve. The relation in level defines the volume of warm condensate that is collected and temporarily hidden and trapped in the container when the first valve is closed. As long as the second outlet is positioned above the first outlet, a volume will be defined in which the condensate is collected.

Further, it is noted that the reference cited by the examiner on page 4 of the office action, i.e. column 4 line 23 to column 5 line 15 of Alsenz, refers to the system depicted in Fig. 4, which system comprises only one evaporator and is therefore irrelevant for the present invention.

As a result, Alsenz does not disclose all of the claim limitations of claim 1, as is required by law to support a rejection under 35 U.S.C. 102. Accordingly, it is respectfully submitted that independent claim 1 is in condition for allowance. Further, because claims 2-6 depend directly or indirectly from independent claim 1, it is respectfully submitted that claims 2-6 are also in condition for allowance. Notice to this effect is respectfully requested.

Regarding claim 7, the above argumentation is also valid for independent claim 7 since Alsenz does not disclose the steps of temporarily collecting a portion of the condensate within the container as a non-circulating, hidden volume for later evaporation in a first evaporator, and circulating at least a part of the remaining condensate through a second evaporator when the hidden volume has been filled.

As a result, Alsenz does not teach or suggest all of the claim limitations of claim 7, as is required by law to support a rejection under 35 U.S.C. 102. Accordingly, it is respectfully submitted that independent claim 7 is in condition for allowance. Notice to this effect is respectfully requested.

Claim 5 was rejected under 35 U.S.C. 103 over Alsenz in view of TOSA (JP-10-122676). As an initial matter, because claim 5 is dependent upon claim 1, which is believed to be in condition for allowance, it is respectfully submitted that the rejection under TOSA is moot. Further, the refrigeration system disclosed by TOSA does not disclose any refrigeration system comprising two evaporators and a container such as

defined by claim 1 of the present invention. Specifically, TOSA does not disclose or suggest that the container is an integrated part of the condenser, as is required by claim 5. As a result, neither Alsenz nor TOSA teaches or suggests all of the claim limitations of claim 5, as is required by law to support a rejection under 35 U.S.C. 103.

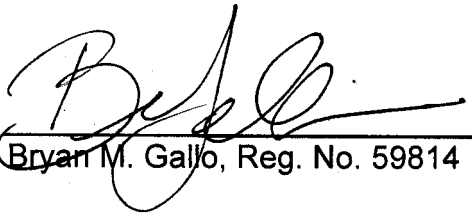
Accordingly, it is respectfully submitted that claim 5 is in condition for allowance. Notice to this effect is respectfully requested.

In light of the foregoing, it is respectfully submitted that the present application is in condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any fees required by this communication, please charge such fees to our Deposit Account No. 16-0820, Order No. ABE-38828.

Respectfully submitted,
Pearne & Gordon LLP

By:



Bryan M. Gallo, Reg. No. 59814

1801 East 9th Street
Suite 1200
Cleveland, Ohio 44114-3108
216-579-1700

March 13, 2008